A. Lawrence
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICANT: Boyce D. Burts, Jr.	§	**ART UNIT NO.: 1743**
	§	
FILED: April 22, 1999	§	
	§	**EXAMINER: L. Cross**
SERIAL NO.: 09/296,217	§	
	§	
TITLE: *Well Lost Circulation Treatment Fluid Made Therefrom, Method of Minimizing Lost Circulation in a Subterranean Formation*	§	**ATTORNEY DOCKET NO. 23267/15DC1**

Commissioner of Patents
BOX RESPONSES
Washington, D.C. 20231

Appellant's Brief Under 37 CFR 1.192

The Assistant Commissioner of Patents
Washington, DC 20231

Dear Sir:

In support of an Appeal on the above referenced application, this Appellant's Brief is hereby submitted in conformance with 37 CFR 1.192.

I. Real party in interest

Bottom Line Industries, Lafayette, LA.

II. Related appeals and interferences

Notices of Appeal were filed for the following three applications on January 7, 2002, with essentially the same issues in all three. As the issues are believed to be so intertwined, it is very respectfully suggested that the Board examine all three of these applications at the same time.

09/296, 216, filed April 22, 1999
09/296,217, filed April 22, 1999
09/307,544, filed May 7, 1999

III. Status of claims

Claims 1-13 are pending.

IV. Status of amendments

No amendments were filed subsequent to final rejection.

V. Summary of the invention

The claims are directed to a well lost circulation additive[1] (claims 1-10) and a method of forming a lost circulation additive (claims 11-13).

The oil well drilling art is replete with examples of crosslinked polymeric gels used as well fluid additives. The art also teaches that reinforcing materials may be added to the

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[1] A "lost circulation addtive" is a type of well fluid additive used with a hydrocarbon well to help stop/prevent/reduce losses of the well fluid to the formation.

polymeric gels.[2]

The advance of the present invention is that the additive of claims 1-10 and as required in claims 11-13, is a *"dry mixture" of* ***all three*** of the components (i.e., crosslinkable polymer, crosslinking agent and reinforcing material).

The applicant's "dry mixture" of all three of the components is merely the latest in the on-going evolution of the drill art. In essence, the art has evolved as follows:

(1) early art taught sequential injection of solutions of the polymer components into the subterranean;

(2) with an improvement being formation of a single aqueous gelation solution at the surface;

(3) with a further improvement being formation of a gel solution to which the fibers are then added;

Now, as an even further evolution, the applicant teaches a dry mix of all three of the components (i.e., polymer, crosslinking agent and reinforcing material).

VI. Issues[3]

1st rejection under 35 U.S.C. 103(a): Claims 1, 2, and 7 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,989,673 to Sydansk (hereinafter

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[2] Because a "gel" is not dry, at no point is there a "dry mixture" of all three of crosslinkable polymer, crosslinking agent, and reinforcing agent.

[3] Claims 1-13 also stand rejected under three"provisional" obviousness-type double patenting rejections, for which applicant will file a Terminal Disclaimer should the conflicting claims be allowed.

referred to Sydansk '673) in view of US Patent 4,566,979 to Githens (hereinafter Githens '979).

2nd rejection under 35 U.S.C. 103(a): Claims 1-4 and 7 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,377,760 to Merrill (herein referred to as Merrill '760) in view of Githens '979.

3rd rejection under 35 U.S.C. 103(a): Claims 1, 2 and 5-13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,004,553 to House et al (herein referred to as House et al '553) in view of U.S. Patent 3,208,524 to Horner et al (herein referred to as Horner et al '524) and Githens '979.

VII. Grouping of claims

For the 1st rejection, claims 1, 2 and 7 stand or fall together.

For the 2nd rejection, claims 1-4 and 7 stand or fall together.

For the 3rd rejection, claims 1,2 and 5-13 stand or fall together.

VIII. Argument

A. Evolution of the art.

Before addressing the substantive rejections, the present invention will first be discussed in the context of the evolution of the art, which is as follows:

Sequential injection of components. The prior art taught the "sequential injection of the gel components followed by in situ [(i.e., in the subterranean)] mixing because gel systems mixed on the surface are difficult to regulate. Systems mixed on the surface often gel at an excessive rate, forming gel balls before they can effectively penetrate the treatment region." U.S. Patent No. 4,770,245, col. 1, lines 41-47. *See also,* U.S. Patent No. 5,415,229, col. 1, lines 33-53; U.S. Patent No. 5,377,760, col. 1, lines 34-38 (cited in making rejection); U.S. Patent No. 4,844,168, col. 1, lines 51-55.[4]

Single aqueous gelation solution at the surface. The art next taught the formation of a single aqueous gelation solution at the surface. *See again*, U.S. Patent No. 5,415,229, col. 1, line 54 to col. 2, line 40.

Adding "reinforcing fibers" to the single aqueous gelation solution. The next evolution was the addition of reinforcing fibers into the gelation solution." *See*, U.S. Patent No. 5,377,760, col. 2, lines 42-50 (cited in making rejection).[5]

Inventor Burts now proposes a "dry mixture" of polymer, crosslinking agent and reinforcing fibers. To this dry mixture is then added water to form

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[4] These patents are all of record in Grandparent application 08/962,214, now U.S. Patent No. 6,102,121.

[5] Please note that "reinforcing fibers" are distinguished from and are an improvement over "inert fillers" such as fine rock particles or glass beads. *See,* U.S. Patent No. 5,377,760, col. 1, lines 47-50.

the well fluid.

B. Discussion of Specific Rejections

1. 1st rejection under 35 U.S.C. 103(a): Claims 1, 2, and 7 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,989,673 to Sydansk (hereinafter referred to Sydansk '673) in view of US Patent 4,566,979 to Githens (hereinafter Githens '979).

The Examiner admits that "Sydansk '673 differ from the instantly claimed invention in that Sydansk does not appear to teach a dry mixture of water soluble crosslinkable polymer, crosslinking agent, and reinforcing material."

The Examiner further notes that "Githers '979 teach[es] a dry mixture of a crosslinking compound and a hydratable gelling agent, wherein the dry mixture can be activated by the addition of water."

The Examiner concludes "in view of the teachings of Githens '979 it would have been obvious to one of ordinary skill in the art to use a dry mixture of the components of Sydansk '673 to provide better storage stability for the components."

Very respectfully, applicant responds as follows.

Applicant agrees with the Examiner that "Sydansk '673 differs from the instantly claimed invention in that Sydansk does not appear to teach a dry mixture of water soluble crosslinkable polymer, crosslinking agent, and reinforcing material." Further, applicant notes

that "**sand**" is among the "inert solids" that Sydansk teaches can be added to the "gel." *See,* Sydansk '673, col. 6, line 59.

Applicant also agrees with the Examiner that "Githens '979 teach[es] a dry mixture of a crosslinking compound and a hydratable gelling agent, wherein the dry mixture can be activated by the addition of water."

However, applicant respectfully disagrees that the combination of Githens and Sydansk would suggest using all of the Sydansk components (i.e., polymer, crosslinking agent and inert fillers) in dry form. Specifically, not even Githens '979 teaches that an "inert filler" would be part of the dry mixture of polymer and crosslinking agent. In fact, the only specific teaching in Githens is that an inert filler, such as sand, would be added to a **gel** of the polymer and crosslinking agent (i.e., a "gel" is wet, as it is formed by adding water to the dry mixture). Attention is kindly directed to Githens, col. 5, line 59 to col. 6, line 25, most specifically, col. 6, lines 19-20 ("the 20/40 sand is proportioned through the blender into the SCHC-Gel at the desired ratio"). Very respectfully, please notice that Githens teaches the addition of sand (i.e., and "inert filler") to the gel (i.e., in wet form after water has been added).

Clearly the Examiner has misread Githers. Before going any further, applicant very respectfully notes that it is quite clear that the Examiner has **mistakenly** read Githens, and such appears to be the basis for rejections. Referring now to the 9/7/01 Office action, at page 11, the Examiner correctly notes the "difference between the teachings of these references (i.e., Sydansk, Merrill, and House in view of Horner) and the instantly claimed

invention lays in the lack of disclosure [of] a dry mixture of components" (lines 7-8, emphasis added). At lines 8-10, the Examiner states that "Githers readily recognizes the need for dry mixed components which can be activated upon addition of water to provide a viscous fluid having rheological properties suitable for well use. However, this is only partially true, as Githens only proposes a dry mixture of polymer and crosslinking agent, which dry mixture does not include reinforcing materials such as sand. And, at lines 10-11, the Examiner is clearly mistaken in stating "[i]t is noted that Githens does not teach the additional use of reinforcing material. Again, attention is kindly directed to Githens, col. 5, line 59 to col. 6, line 25, most specifically, col. 6, lines 19-20 ("the 20/40 sand is proportioned through the blender into the SCHC-Gel at the desired ratio") (Sydansk '673, col. 6, lines 57-61, teaches that sand can be added to gel to enhance strength).

Thus, the consistent teaching of Sydansk, Merrill, House, Horner, and Githens, is that reinforcing materials are added to a gel.

At best, the combination of Sydansk 673 and Githens '979 would suggest substituting the Githens dry mixture of polymer and crosslinking agent for Sydansk separate polymer and crosslinking components (or *visa versa*). But in any event, whether using the Githens dry mixture or the Sydansk separate dry components, a gel would first be formed, to which would subsequently be added inert fillers including sand.

Claims 1, 2 and 7 are all patentable because of the required "dry mixture" of polymer, crosslinking agent and reinforcing material.

2. **2nd rejection under 35 U.S.C. 103(a)**: Claims 1-4 and 7 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,377,760 to Merrill (herein referred to as Merrill '760) in view of Githens '979. The rejection is respectfully traversed.

In response, applicant agrees with the Examiner that Merrill '760 does not disclose the use of a dry mixture of components.

It is further respectfully noted by applicant that Merrill '760 expressly teaches first making of the gel solution followed by addition of the fibers thereto (i.e., the fibers are added to a wet polymer). Specifically, attention is directed to :

> the Abstract, "fibers are added to a gelation solution;"
>
> col. 2, lines 42-43, "introducing reinforcing fibers into the gelation solution;"
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> col. 3, lines 10-12, "incorporation of fibers in a gel by mixing the fibers with the gelation solution;"
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> col. 5, lines 16-17, "various amounts of the cellulosic and glass fibers were added to the gel;"
>
> col. 5, line 56, "amounts of fiber added to the gel;"
>
> col. 7, lines 7-9, "results further confirm the increased strength produced by adding reinforcing fibers to the gelation solution prior to injection;" and
>
> col. 7, lines 47-48, "fibers are simple to introduce into the gelation solution."

As discussed above, while Githens does disclose a dry mixture of the polymer and crosslinking agent, it teaches the addition of sand (i.e., and "inert filler") to the gel (i.e., in wet form after water has been added).

At best, the combination of Merrill '760 and Githens '979 would suggest substitution of the Githens dry mixture of polymer and crosslinking agent for Merrill gel (or *visa versa*). But in any event, whether using the Githens dry mixture or the Merrill gel, a gel would first be formed, to which would subsequently be added inert fillers including sand.

Claims 1-4 and 7 are all patentable because of the required "dry mixture" of polymer, crosslinking agent and reinforcing material.

3. **3rd rejection under 35 U.S.C. 103(a)**: Claims 1, 2 and 5-13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,004,553 to House et al (herein referred to as House et al '553) in view of U.S. Patent 3,208,524 to Horner et al (herein referred to as Horner et al '524) and Githens '979. The rejection is respectfully traversed.

In response, applicant agrees with the Examiner that House '553 and Horner '524 "differ from the claimed invention in that there is no disclosure of the use of a dry mixture of components.

Further, applicant respectfully notes that House and Horner teach making a solution (i.e., not dry) to which either a reinforcing material/seepage loss additive (see House col. 5, lines 39-41, "compositions of our invention can be prepared by adding the seepage loss reducing agent to the water base or oil base well working fluid") or a bulking agent (see Horner col. 5, lines 43-44, "the bulking agent may be incorporated into the polysaccharide

solution") is added. As discussed above, while Githens does disclose a dry mixture of the polymer and crosslinking agent, it teaches the addition of sand (i.e., and "inert filler") to the gel (i.e., in wet form after water has been added).

At best, the combination of House, Horner and Githens '979 would suggest substitution of the Githens dry mixture of polymer and crosslinking agent for House gel or Horner gel (or *visa versa*). But in any event, whether using the Githens dry mixture or the House or Horner gels, a gel would first be formed, to which would subsequently be added inert fillers including sand.

Claims 1, 2 and 5-13 are all patentable because of the required "dry mixture" of polymer, crosslinking agent and reinforcing material.

C. Discussion of Parent Application and Related Applications (all issued)

In addition to the reasons for patentability discussed above, applicant respectfully offers that following additional arguments to buttress the proposition that a "dry mixture" of polymer, crosslinking agent and reinforcing material are not disclosed or suggested by Sydansk, Merill, House or Horner.

1. "Method of Use"-Type Claims Allowed in Parent Application

It is respectfully noted that "method of use" type claims were allowed in parent application serial number 08/962,215, now issued as U.S. Patent No. 6,016,879. The pending claims of the instant pending application are directed to a "lost circulation additive"

(claims 1-10), and "a method of forming a lost circulation fluid" (claims 11-13). Claim 1 of the '879 patent is directed to a "method for plugging an opening in a subterranean formation" using the "conformance additive" of the instant pending claims. In Table 1 below is provided a comparison of the instant pending independent claims 1 and 11, and claim 1 from the '121 patent.

Table 1
Comparison of Pending Claims 1 & 11, with Claim 1 of the '712 Patent

Claim 1, '712 Patent	Pending Claim 11	Pending Claim 1

A method for plugging an opening in a subterranean formation comprising: (a) providing a conformance additive comprising ***a dry mixture of water soluble crosslinkable polymer, a crosslinking agent, and a reinforcing material selected from among fibers and comminuted plant materials*** wherein the polymer is a carboxylate-containing polymer and the crosslinking agent is a chromic carboxylate complex; (b) contacting the well plug additive with water or an aqueous solution to form a well plug fluid; (c) injecting the well plug fluid into the wellbore of said well; and (d) crosslinking said well plug fluid in said wellbore to form a non-flowing well plug fluid which substanitally plugs said well.	A method of forming a well plug fluid comprising: (a) providing a conformance additive comprising ***a dry mixture of water soluble crosslinkable polymer, a crosslinking agent, and a reinforcing material selected from among fibers and comminuted plant materials***; and (b) contacting the conformance additive with water or an aqueous solution to form the well plug fluid.	A conformance a comprising ***a dry soluble crosslink crosslinking age material selected and comminuted***

2. **Instant Prior Art Was Cited In Parent Application**

Four of the five prior art patents form the basis of the instant § 103 rejections, and are:

U.S. Patent No. 4,989,673 to Sydansk;

U.S. Patent No. 5,377,760 to Merrill;

U.S. Patent No. 5,004,553 to House et al.; and

U.S. Patent No. 3,208,534 to Horner et al.

It is respectfully noted that these four patents **were all cited in the parent application**, now issued as U.S. Patent 6,016,879.

3. **Invention Is Properly To Well Plug Additive, Method of Making, Method Of Using**

The Federal Circuit has held that

> [w]hen a new and useful compound or group of compounds is invented or discovered having a particular use it is often the case that what is really a single invention may be viewed legally as having three or more different aspects permitting it to be claimed in different ways, for example: (1) the compounds themselves; (2) the method or process of making the compounds; and (3) the method or process of using the compounds for their intended purpose.
>
> *In re Pleuddemann*, 910 F.2d 823, 825-826 (Fed.Cir. 1990)

Thus, categorizing the inventions of the instant claims and the parent application (now the '712 patent) as taught by *Pleuddemann* results in:

(1) the compounds themselves
Pending claims 1-10.

(2) the method or process of making the compounds
Pending claims 11-13.

(3) the method or process of using the compounds for their intended purpose
'879 Patent.

4. Cited Art Relates to Well Fluids, And Methods of Making and Using

Sydansk, Merrill, House and Horner, all collectively relate to well fluids, methods of using well fluids in the operating of a subterranean well, and to methods of making well fluids. Specifically, Sydansk, discloses well fluids comprising crosslinkable polymer, a crosslinking agent, and a reinforcing material. Even more specifically, Sydansk, discloses details regarding the well fluid, making of the well fluid, and use of the well fluid.

5. Cited Art Does Not *DISCLOSE* "Dry Mixture"

Without question, none of Sydansk, Merrill, House or Horner, disclose the claim limitation "***dry mixture of water soluble crosslinkable polymer, a crosslinking agent, and***

a reinforcing material selected from among fibers and comminuted plant materials." In fact, the Office action even states that "Sydansk does not appear to teach a dry mixture of water soluble crosslinkable polymer, crosslinkable agent and reinforcing material." Paper No. 13, Office Action of December 19, 2000, at 5.

6. **Cited Art Does Not *SUGGEST* "Dry Mixture"**

Parent Application "dry mixture" claims issued over prior art

In support of applicant's argument that Sydansk, Merrill, House and Horner do not suggest the recited "dry mixture" limitation, attention is directed to U.S. Patent No. 6,102,121. It is respectfully noted that over Sydansk, Merrill, House and Horner, the '121 patent issued with claims directed to "plugging an opening in a subterranean formation" using "***a dry mixture of water soluble crosslinkable polymer, a crosslinking agent, and a reinforcing material selected from among fibers and comminuted plant materials. . . .***"

Because collectively Sydansk, Merrill, House and Horner relate to well fluids, and methods of making and using well fluids, and because the '121 Patent issued over Sydansk, Merrill, House and Horner with one of the essential limitations of claim 1 of the '121 Patent being "providing a conformance additive comprising ***a dry mixture of water soluble crosslinkable polymer, a crosslinking agent, and a reinforcing material selected from among fibers and comminuted plant materials,***"none of Sydansk, Merrill, House, nor

Horner can be said to disclose the "dry mixture" limitation.

7. **In Addition, A Number of Inventor Burt's Other "Dry Mixture" Patents Have Issued Over Sydansk, Merrill, House and Horner**

In addition to the instant application claiming priority back to October 31, 1997, applicant filed a number of other "dry mixture" patent applications also on October 31, 1997, which have now issued as patents. These patents were also issued over Sydansk, Merrill, House and Horner, and are as follows:

> U.S. Patent No. 6,016,869, filed October 31, 1997, issued January 25, 2000, with claims directed to a method of killing a well using ***a well kill additive comprising a dry mixture of water soluble crosslinkable polymer, a crosslinking agent, and a reinforcing material selected from among fibers and comminuted plant materials***;
>
> U.S. Patent No. 6,016,871, filed October 31, 1997, issued January 25, 2000 with claims directed to a method for hydraulically fracturing a subterranean hydrocarbon bearing formation using ***a hydraulic fracturing additive comprising a dry mixture of water soluble crosslinkable polymer, a crosslinking agent, and a reinforcing material selected from among fibers and comminuted plant materials***;
>
> U.S. Patent No. 6,016,879, filed October 31, 1997, issued January 25, 2000, with claims directed to a method for preventing lost circulation using ***a lost circulation additive comprising a dry mixture of water soluble crosslinkable polymer, a crosslinking agent,and a reinforcing material selected from among fibers and comminuted plant materials***.
>
> U.S. Patent No. 6,098,712, filed October 31, 1997, issued August 8, 2000 with claims directed to a method of plugging a well in fluid communication with a subterranean formation using ***a well plug additive comprising a dry mixture of water soluble crosslinkable polymer, a crosslinking agent, and a***

reinforcing material selected from among fibers and comminuted plant materials;

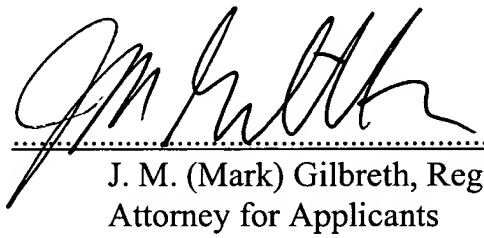
In further support of applicant's argument that Sydansk, Merrill, House and Horner do not suggest the recited "dry mixture" limitation, attention is directed to the above discussed U.S. Patent Nos. 6,016,869, 6,016,871, and 6,016,879, and 6,098,712, all of which issued with methods of using "***a dry mixture of water soluble crosslinkable polymer, a crosslinking agent, and a reinforcing material selected from among fibers and comminuted plant materials***."

Because, one of the essential limitations of each of these patents is believed to be the limitation of providing an "additive comprising ***a dry mixture of water soluble crosslinkable polymer, a crosslinking agent, and a reinforcing material selected from among fibers and comminuted plant materials***," and because all of Sydansk, Merrill, House, and Horner were of record in the prosecution of these patents, none of Sydansk, Merrill, House, nor Horner can be said to disclose the "dry mixture" limitation.

In view of the above prompt allowance of all pending claims is respectfully requested.

If it would be of assistance in resolving any issues in this application, the Examiner or Board are kindly invited to contact applicants' attorney Mark Gilbreth or agent Mary Gilbreth at 713/227-1200.

Respectfully submitted,



Date: May 7, 2002

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APPENDIX -PENDING CLAIMS

fraction and corn cob fraction; and mixtures of comminuted rice fraction and corn cob fraction and at least one of wood fiber, nut shells, and paper.

13. The additive of claim 12 wherein the reinforcing material comprises comminuted mixture of rice fraction, corn cob pith and chaff, cedar fiber, nut shells, and paper.

I CLAIM:

1. A lost circulation additive comprising a dry mixture of a water soluble crosslinkable polymer, a crosslinking agent, and a reinforcing material selected from among fibers and comminuted plant materials.

2. The additive of claim 1 wherein the polymer is an a carboxylate-containing polymer and the crosslinking agent is a chromic carboxylate complex.

3. The additive of claim 2 wherein the reinforcing material comprises hydrophilic and hydrophobic fibers.

4. The additive of claim 3 wherein the hydrophobic fibers comprise at least one selected from the group of hydrophobic fibers consisting essentially of nylon, rayon, and hydrocarbon fibers, and wherein the hydrophilic fibers comprise at least one selected from the group of hydrophilic fibers consisting essentially of glass, cellulose, carbon, silicon, graphite, calcined petroleum coke, and cotton fibers.

5. The additive of claim 2 wherein the reinforcing material comprises comminuted plant material.

6. The additive of claim 5 wherein the reinforcing material comprises at least one comminuted material selected from the group of comminuted plant materials consisting essentially of nut and seed shells or hulls of almond, brazil, cocoa bean, coconut, cotton, flax, grass, linseed, maize, millet, oat, peach, peanut, rice, rye, soybean, sunflower, walnut, and wheat; rice tips; rice straw; rice bran; crude pectate pulp; peat moss fibers; flax; cotton; cotton linters; wool; sugar cane; paper; bagasse; bamboo; corn stalks; sawdust; wood; bark; straw; cork; dehydrated vegetable matter; whole ground corn cobs; corn cob light density pith core; corn cob ground woody ring portion; corn cob chaff portion; cotton seed stems; flax stems; wheat stems; sunflower seed stems; soybean stems; maize stems; rye grass stems; millet stems; and mixtures thereof.

7. The additive of claim 2 wherein the polymer is a partially hydrolyzed polyacrylamide.

8. The additive of claim 7 wherein the reinforcing material is a comminuted material selected from among comminuted materials derived from peanuts, wood, paper any portion of rice seed or plant, any portion of corn cobs, and mixtures thereof.

9. The additive of claim 8 wherein the additive further includes cellophane, and wherein the reinforcing material is a comminuted material selected from among mixtures of comminuted rice fraction and peanut hulls; mixtures of comminuted rice fraction, and wood fiber or almond hulls; mixtures of comminuted rice fraction and corn cob fraction; and mixtures of comminuted rice fraction and corn cob fraction and at least one of wood fiber, nut shells, and paper.

10. The additive of claim 9 wherein the reinforcing material comprises comminuted mixture of rice fraction,

corn cob pith and chaff, cedar fiber, nut shells, and paper.

11. A method of forming a lost circulation fluid comprising:

(a) providing a lost circulation additive comprising a dry mixture of water soluble crosslinkable polymer, a crosslinking agent, and a reinforcing material selected from among fibers and comminuted plant materials; and

(b) contacting the lost circulation additive with water or an aqueous solution to form the lost circulation fluid.

12. The method of claim 11 wherein the polymer is a partially hydrolyzed polyacrylamide, the crosslinking agent is a chromic carboxylate complex, wherein the additive further includes cellophane, and wherein the reinforcing material is a comminuted material selected from among mixtures of comminuted rice fraction and peanut hulls; mixtures of comminuted rice fraction, and wood fiber or almond hulls; mixtures of comminuted rice